Aftermath

Vol.4, Num. 2 The East Texas State University Mathematics Department Newsletter Fall 1990

FOURTH ANNUAL HOMECOMING ALUMNI BREAKFAST SCHEDULED

The 1990 Homecoming Alumni Breakfast will be held at 9:00 a.m., Saturday, November 3, in the Bluebonnet-Pecan-Friendship rooms in the Sam Rayburn Memorial Student Center. Attendance at the Breakfast has increased considerably each year, and another successful event is expected this year. The later starting time is to allow alumni who live within commuting distance of ETSU to comfortably drive in on the morning of the Breakfast. If you would like to attend, please fill out the form found elsewhere in this newsletter and mail it to the ETSU Mathematics Department by October 26, 1990. We hope to see you there.

SPACE EXPOSED SEEDS GROWN

In April, 1984, the Long Duration Exposure Facility (LDEF) was launched by shuttle. On board were 12.5 million tomato seeds. This was the first stage of the Space Exposed Experiment Developed for Students (SEEDS) Project. The seeds, contained in four layers of the LDEF, were exposed to the environment of space for almost six years. Returned to Earth in January, 1990, the seeds were packaged with control seeds into 121,000 kits for distribution to about 60,000 teachers.

Dr. John Lamb, Jr. received some of the kits. After the seeds had been planted, seedlings were then given to several students and faculty for growing. Records of the experiments were kept by the participants and are now being reported to NASA.

The SEEDS Project was capped by a party at Dr. Lamb's house on September 8, 1990 where there was much tasting of the fruit produced. Some second generation seeds were also collected for a continuation of the project.

MATHEMATICS FACULTY ACTIVITIES

Several faculty members presented papers at the annual meeting of the Texas Section of the Mathematical Association of America held April 5-7, 1990, at the University of North Texas in Denton. They were as follows:

Stuart Anderson and **Dale Bedgood**, "Teaching a History of Mathematics Course Without a Historian"

Bill Aslan, "A Note on Workshops for Retraining Teachers"

Archie Brock and Richard Dubes, "A Profile of Freshman Mathematics Classes at ETSU using PreTASP, MAA Algebra Test and Math ACT Scores"

John Lamb, Jr, "A Computer Search for Regular and Semi-Regular Tessellations" and "Never Say 'No Slope' Again"

John Lamb, Jr, has had two articles published in 1990: "A Computer Search for Narcissistic Loops," in the March, 1990 issue of School Science and Mathematics, and "Never Say 'No Slope' Again," in the March, 1990 issue of Texas Mathematics Teacher.

The following Chautauqua courses were attended during 1990:

Stuart Anderson, "Historical Consideration as a Tool in Teaching Modern Science," University of New York, Stony Brook, April 12-14.

John Lamb, Jr, "Using the Space Program Applications as Practical Examples for Undergraduate Physics and Mathematics Courses," Jet Propulsion Laboratory, Pasadena, California, March 8-10.

Vance Underhill, "Dynamical Systems: Chaos, Fractals and Catastrophes," Christian Brothers University, Memphis, Tennessee, April 5-7.

BOOK REVIEW

by Vance Underhill

Keith Devlin is a noted research mathematician who is also a skilled expositor of mathematics. His latest book, Mathematics: The New Golden Age, published in 1988 by Penguin, is a successful attempt to convey to the lay person some of the areas of activity in modern mathematics. He concentrates on achievements of the past 25 years, especially the latter part of this period. Although some of the problems discussed are intrinsically technical in nature, he is able to sidestep tedious details and present enough information for the reader to gain a general understanding of what is involved.

One topic which Devlin discusses at length is that of prime numbers. Although this was once an area claimed by "pure" mathematics, it has become very "applied" in recent years. This is due to the discovery that security codes can be

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constructed based on the fact that large numbers (around 150 digits) cannot easily be factored into primes, even with the use of computers. The most popular security system today, the RSA System, is built on this principle.

Quite a few famous problems in mathematics are discussed in the book. Some have been solved in recent years, while others have not. The Class Number Problem goes back to the time of Gauss, but it was settled in 1983 in a proof of 300 pages.

If that seems like a long proof, consider the Classification Problem for Finite Simple Groups. The problem here is to identify all finite simple groups (the definition of a simple group is not easily given). By the time this was accomplished in 1980, more than 100 mathematicians had contributed to the solution, which covered nearly 15,000 pages in some 500 journal articles.

What of the famous Fermat's Last Theorem: $x^n + y^n = z^n$ has no positive integral solutions if $n > 2$? It remains unsolved, but progress has been made. Computers have shown that if there is a solution, the exponent must be at least 125,000. Moreover, Gerd Faltings proved in 1983 that any such equation can have at most finitely many primitive solutions (no common factor greater than one). This result earned Faltings a Fields Medal, the mathematical equivalent of the Nobel Prize.

A majority of professional mathematicians would agree that the most important unsolved problem in mathematics is the Riemann Hypothesis (all complex zeros of the Zeta Function have real part exactly equal to 1/2). Many have worked on this difficult problem, including the famous British mathematician, G. H. Hardy. When Hardy was forced to take a ferry from Scandinavia to England on a day when the weather was unusually fierce, he sent a postcard to a friend with the message, "Have proved the Riemann Hypothesis. Yours, G. H. Hardy." Hardy reasoned that God would not allow him to die and receive undeserved credit for such an important result. Hardy made the crossing safely, and the conjecture is still unproved.

Naturally enough, computers have been brought to bear on this famous problem, and all numerical evidence supports Riemann's conjecture. If it is false, it will be for numbers which are enormously large. Mathematicians have learned not to put too much faith in numerical results, for surprises do occur. The Mertens Conjecture, stated in 1897, declared that a certain inequality was true for every positive integer n. Numerical evidence began to accumulate which suggested the truth of the conjecture. It was finally shown in 1983 to be false, and the smallest number for which it fails is of the order of 10^{30}. (The staggering size of this number is indicated by the fact that the total number of particles in the universe is estimated to be something like 10^{88}).

Many other topics are covered in the book, all quite current: fractals (figures having a fractional dimension), knot theory, undecidable propositions, the efficiency of algorithms, to mention a few. The presentation is non-technical, though references are given for follow-up reading. The 11 chapters are largely independent of one another, so the reader can easily skip over topics which are too difficult or uninteresting. Devlin succeeds in conveying the vitality of modern mathematics and the directions in which it is moving.

DEPARTMENT HEAD'S COLUMN

by Stuart Anderson

For many years Dr. Cecil B. Wright was a valued member of the mathematics department at ETSU. Even though it has been well over twenty years since he was here, he is often a subject of remark around the offices. It is quite striking that at the mention of his name, those who knew him are eager to describe his many fine qualities. He was clearly a man who received a great amount of respect and admiration.

Several alumni have asked that we tell more about Dr. Wright in the pages of AFTERMATH. I am pleased to report that Dr. Bedgood is working on just such an article. It will appear in a future issue. If you have anecdotes or information which you think might be useful for the article, please feel free to write to Dr. Bedgood.

* * * *

In this issue, you will find a short questionnaire. I hope you will take a few minutes to respond and return it to us. As always, we value your opinions and would like to use them to improve our program.

* * * *

There are two new faculty members in the department this year: Bryan Allen and Cynthia Steward. We are pleased to have them helping us with the unusually large numbers enrolled in our freshman-level courses.

Bryan has a B.S. degree from East Texas Baptist University in Marshall, Texas and an M.S. degree from ETSU. Cynthia has a B.S. from ETSU and an M.S. in the teaching of mathematics from Stephen F. Austin University in Nacodoches, Texas.

The two new faculty members are helping to fill the void created by the temporary departure of Dr. Bill Aslan. Dr. Aslan is on a one-year leave-of-absence at the University of Nevada, Las Vegas where he is teaching and supporting their mathematics education program.

MATH CLUB NEWS

We were proud to donate $300 to the W. W. "Bub" Taylor Scholarship Fund during the past year. The money was raised through an attempt to collect a "mile of pennies" and a bake sale.

We were honored to have George McAlister address one of our meetings in April. He is an alumnus of ETSU and is now a San Antonio businessman. He gave us some insights into the "super-collider" project being undertaken near Waxahachie. He also told how his degrees in mathematics had served him well in many endeavors.

Dr. Doug Richey, another ETSU alumnus, was the speaker at our annual banquet on March 23, 1990. He related several anecdotes from the time he started as a high school coach and mathematics teacher to his present position on the faculty at Northeast Texas Community College in Mount Pleasant. This followed a rap by Kevin Brewer and a skit by Cynthia Steward. It all added up to a very special evening.

A chapter of the Mathematical Association of America (MAA) Student Chapter was started at ETSU. Last year was the inaugural year for such chapters. Thanks in large part to the efforts of Dr. John Lamb, Jr. and its present President, David C. Brown of Dallas, we were able to get eight members to begin. Officers for Pi Mu Epsilon for the 1990-91 school year are Jean Jones of DeKalb, President and Stephen E. Dyer of Longview, Vice-President. Alpha Gamma Alpha President is Rebecca Sutton of Grand Saline and Vice-President is S. G. Gainer of Sulphur Springs. Secretary-Treasurer of both clubs is Patricia Young of Commerce.

ALUMNI FOCUS

In the past, this column has highlighted graduates who were well-established in their careers. However, this issue we feature a relatively recent alumnus.

Charlotte Simmons is a 1988 graduate of ETSU with majors in mathematics and English. Her significant accomplishments in so short a time deserve reporting. This year Charlotte was selected to receive the very prestigious Centennial Research Scholarship at the University of Oklahoma. This award will provide four years of support, enabling her to work on her doctorate in mathematics.

Charlotte grew up in DeKalb, Texas where she graduated from high school as valedictorian. Her average (99) was the highest ever recorded at that school. Charlotte credits her family as a source of encouragement and inspiration. "For my Father, 98's were not good enough," she said laughingly.

After high school, Charlotte received a scholarship to ETSU where she again distinguished herself. Her academic skills were not limited to mathematics. She was able to use her writing skills to win a $1,000 composition prize. She wrote an honors thesis, "Important Algebraists: Observations on Sir William Rowan Hamilton and George Boole," under the direction of Stuart Anderson. Results of the paper were presented at the Texas Section of the Mathematical Association of America at Trinity University and at the state Alpha Chi convention at Sam Houston State University. As a result of her outstanding work, she graduated in 1988 with highest honors.

After considering several schools, Charlotte decided on the University of North Texas for graduate study. Once more she displayed convincing evidence of her academic abilities. As a teaching fellow, she also received many accolades from her students. Her masters thesis, "Hyperspaces of Continua," was written under the direction of Dr. Melvin Hagan. If the scholarship to the University of Oklahoma had not interfered, Charlotte might have stayed at UNT for her doctorate. John Ed Allen, Department Head at UNT, said, "We were very disappointed to see her leave." He also reported that if she had stayed, she would have been nominated for Outstanding Teaching Fellow.

At the University of Oklahoma, Charlotte is carrying a full load consisting of Complex Variables, Algebraic Topology, and Differential Geometry. She also finds time to serve as the Mathematics Department representative on the Graduate Senate. After completing her doctorate, Charlotte intends to teach at the university level. No doubt she will continue to be a model of success in that endeavor.

Charlotte is only one of many of our graduates who go on to higher studies in mathematics. At the present time there are several schools around the country which are populated with ETSU alumni. We are pleased and proud of their success, each one demonstrating the quality of our programs at ETSU.

ALUMNI NOTES

Toye, Gene BS (85)
1601 San Francisco
Carrollton, TX 75007
Mr. Toye has recently been promoted to Senior Software Engineer with Harris Adacom.

Glover, Charlotte BS(76), MS(80)
1920 Sycamore
Paris, TX 75460

Jones, Kenneth BS(73)
Rt.2, Box 14
Springlake, TX 79082
Teacher Springlake-Earth

Key, Oneida BS(79)
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ALUMNI QUESTIONNAIRE
Please return to:
Department of Mathematics, ETSU
Commerce, Texas 75429

1. How many years have you been employed in the type of job you now hold?

2. What degree(s) do you hold from East Texas State University?

3. Did you prepare for your current job while you were in college, or did you make a career change after graduation?

4. Compared to individuals with similar training in mathematics from other colleges and universities, would you say your preparation was (a) better than, (b) about the same as, or (c) not as good as theirs? Please elaborate on your answer.

5. What mathematics courses that you took have been particularly useful to you? Which, if any, courses were available but which you did not take and wish that you had? Which, if any, courses were not offered but which would have helped you considerably? (Don't confine your answer to mathematics courses only).

6. Please rate the quality of instruction at East Texas State University:
(a) in the Department of Mathematics.

(b) outside the Department of Mathematics.

7. If you are a teacher, do you feel that your teacher preparation was:
(a) excellent, (b) average, (c) inferior?

Please elaborate.

8. Please make any comments or suggestions which will help us to improve the quality of instruction in our department and the preparation of graduates in mathematics for their various careers.

ALUMNI BREAKFAST RESERVATION FORM AND / OR ALUMNI NEWS UPDATE

Name : _____

Address : _____

City, State & Zip : _____

Phone : _____

Please reserve _____ places at the Homecoming Alumni Breakfast at $5.00 each.

Total Enclosed : $_____

My news for the Alumni News Column is : _____

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